greater than a bonding strength between said conductor and said insulating base on a wall surface of said conductor.

REMARKS

I. Introduction

In response to the pending Office Action, Applicants have amended claims 2, 4, 6, 7 and 9 so as to address the pending rejection of the claims under 35 U.S.C. § 112, second paragraph. No new matter has been added.

Applicants note with appreciation the indication of allowable subject matter being recited by claims 3 and 9.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. The Objection To The Drawings

With regard to the objection to the drawings set forth in paragraph 3 of the Office Action, Applicants wish to direct the Examiner's attention to Fig. 9 and pages 23 and 24 of the specification. As set forth therein, the non-contact region (i.e., non-bonding region recited by claim 6) is illustrated, for example, in Fig. 9 as element 5f. As noted in the specification, the non-bonding regions 5f function to weaken the bond between the wiring layer and the insulating base. In view of the foregoing, it is respectfully submitted

that the term "non-bonding region" is disclosed and supported by the specification as originally filed.

III. The Rejection Of The Claims Under 35 U.S.C. § 112, Second Paragraph

Claims 2, 4, 6, 7 and 9 were rejected under 35 U.S.C. § 112, second paragraph, for being indefinite for the various reasons set forth in paragraph 5 of the Office Action. In response, Applicants have amended claims 2, 4, 6, 7 and 9 so as to address each of the claim terms noted in the pending rejection. It is respectfully submitted that, as amended, claims 2, 4, 6, 7 and 9 satisfy all requirements of 35 U.S.C. § 112, second paragraph.

IV. The Rejection Of The Claims Under 35 U.S.C. § 103

Claims 1, 2, 4-6 and 8 were rejected under 35 U.S.C. § 103 as being unpatentable over USP No. 6,010,769 to Sasaoka in view of USP Publication No. 2002/005247 to Graham. For the following reasons, Applicants respectfully submit that the pending claims are patentable over Sasaoka and Graham.

As recited by claim 1, and explained in the Applicants' previous response, the present invention relates to a circuit substrate having multiple wiring layers separated by an insulating layer, which have vias formed therein, and which are filled with conductive paste (i.e., conductor) in order to couple the wiring layers to one another.

Importantly, the bonding strength between the wiring layer and the conductor is greater than the bonding strength between the wiring layer and the insulating layer. As a result, as explained in detail in the specification (e.g., *see*, pages 16 and 17), because of the foregoing relationship in bonding strength, when stress is caused by the difference in thermal expansion coefficients between the insulating layer and the conductive paste, the interface between the wiring layer and the insulating layer serves to absorb the stress, thereby reducing the possibility of a disconnect between the conductive paste and the wiring layer.

Turning to the cited prior art and the pending rejection, it is admitted in the pending rejection that Sasaoka fails to disclose or suggest the limitation regarding the bonding strength between the wiring layer and the conductor being greater than the bonding strength between the wiring layer and the insulating layer. Graham is relied up as curing this deficiency of Sasaoka. Applicants respectfully submit this conclusion is in error.

Graham discloses a conductive paste that exhibits improved bonding characteristics. As set forth in paragraph [0024], the allegedly novel composite paste comprises a coated metal powder as a filler, and a polymer resin used as a matrix. Referring to paragraph [0028] cited in the pending rejection, the glass transition temperature of the polymer resin must be lower than the melting point of the coated metal powder in order to facilitate the formation of the conductive paste. Thus, the

resin referred to in the pending rejection is the resin that is utilized to form the conductive paste. It is not a resin that is to be utilized in the formation of a component other than the conductive paste itself.

Accordingly, there is no suggestion or disclosure to be found in Graham that would lead one of skill in the art to modify Sasaoka to arrive at the claimed invention that recites that the bonding strength between the wiring layer and the conductor being greater than the bonding strength between the wiring layer and the insulating layer in a multilayer device. As noted above, Graham simply discloses a conductive paste having improved bonding capabilities. Even assuming *arguendo* that Sasaoka was modified to utilize the conductive paste of Graham, this clearly does not necessarily result in the practice of the claimed invention, as it is quite possible that the bond between the wiring layer and the insulating could still have the same strength as the bond between wiring layer and the conductor (i.e., albeit both stronger). ***Importantly, both Sasaoka and Graham appear silent about having different bonding strengths between different layers of the device.***

It is well known that the fact that the prior art could be modified so as to result in the combination defined by the claims at bar would not have made the modification obvious unless the prior art suggests the desirability of the modification. ***In re Deminski***, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986).

Moreover, recognizing after the fact that such a modification would provide an

improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an indication of improper application of hindsight considerations. Simplicity and hindsight are not proper criteria for resolving obviousness. ***In re Warner***, 379 F.2d 1011, 154, USPQ 173 (CCPA 1967).

It is only Applicants' disclosure that discloses a device wherein the bonding strength between the wiring layer and the conductor is greater than the bonding strength between the wiring layer and the insulating layer. Neither Sasaoka nor Graham appear to describe or suggest such features. Moreover, neither Sasaoka nor Graham appear to even acknowledge the problems solved by the present invention. Thus, the only motivation of record for the proposed modification of the device of Sasaoka or Graham to arrive at the claimed invention is found in Applicants' disclosure which, of course, may not properly be relied upon to support the ultimate legal conclusion of obviousness under 35 U.S.C. §103. ***Panduit Corp. v. Dennison Mfg. Co.***, 810 F.2d 1561, 227 1 USPQ2d 1593 (Fed. Cir. 1987).

For all of the foregoing reasons, it is respectfully submitted that the pending claims are patentable over Sasaoka and Graham, taken alone, or in combination with one another.

V. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the

independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, ***Hartness International Inc. v. Simplimatic Engineering Co.***, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also in condition for allowance.

VI. Request For Notice Of Allowance

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

Attached hereto is a clean version of the claims and specification by the current amendment. The attached page is captioned "**APPENDIX**."

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-0417.

Respectfully submitted,

McDERMOTT, WILL & EMERY

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APPENDIX

IN THE CLAIMS:

Claims 2, 4, 6, 7 and 9 have been amended to read as follows:

B1

2. (Twice Amended) The circuit substrate according to claim 1, wherein said conductor contains a resin composition, and a glass transition temperature of the resin composition is set lower than a glass transition temperature of a resin composition contained in said insulating base.

B2

4. (Amended) The circuit substrate according to claim 1, wherein the bonding strength between said wiring layers and said conductor is greater than the bonding strength between said wiring layers and said insulating base in an area of the wiring layer adjacent said conductor.

B3

6. (Twice Amended) The circuit substrate according to claim 1, wherein a non-bonding region is provided between said wiring layers and said insulating base adjacent said conductor.

7. (Twice Amended) The circuit substrate according to claim 1, wherein a region containing an uncured resin component is provided at a bonding site between said wiring layers and said insulating base adjacent said conductor.

9. (Twice Amended) A circuit substrate comprising:

an insulating base; and

B4

a conductor provided inside said insulating base to electrically connect an interlayer of said insulating base,

wherein a tensile strength of said conductor is greater than a bonding strength between said conductor and said insulating base on a wall surface of said conductor.